No. 7700110

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

International Seeds, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF eighteen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

RYEGRASS

'Regal'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington *this* 30th *day of* December *in the year of our Lord one thousand nine hundred and* eighty-three.

Attest:

Kenneth A. Evans
Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

John R Block
Secretary of Agriculture

FORM GR-470 (1-76)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
PLANT VARIETY PROTECTION OFFICE
NATIONAL AGRICULTURAL LIBRARY
BELTSVILLE, MARYLAND 20705

FORM APPROVED OMB NO. 40-R3712

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

1a. TEMPORARY DESIGNATION OF VARIETY	1b. VARIETY NAME	FOR OFFICIAL USE ONLY
PR. 731	REGAL	PV NUMBER 7700110
2. KIND NAME	3. GENUS AND SPECIES NAME	FILING DATE 9-16-77 / TIME 4:00 A.M. (P.M.)
Ryegrass	Lolium perenne	FEE RECEIVED $250.00 / $250.00 / $250.00 — DATE 9-16-77 / 9-16-77 / 11/22/83
4. FAMILY NAME (BOTANICAL)	5. DATE OF DETERMINATION	
Gramineae	September 1, 1975	

6. NAME OF APPLICANT(S)	7. ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*)	8. TELEPHONE AREA CODE AND NUMBER
International Seeds, Inc.	P.O. Box 168 Halsey, OR 97348	503-369-2251

9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: (*Corporation, partnership, association, etc.*)	10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION	11. DATE OF INCORPORATION
Corporation	Oregon	July 1, 1972

12. Name and mailing address of applicant representative(s), if any, to serve in this application and receive all papers:

~~G. W. Pepin~~ MR. STAN ROLLIN
~~International Seeds, Inc.~~ 6802 OREM DRIVE
~~Box 168~~ LAUREL, MD. ~~20810~~
~~Halsey, OR 97348~~ Ltr 1/25/79 20707

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

- [X] 13A. Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
- [X] 13B. Exhibit B, Novelty Statement.
- [X] 13C. Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*
- [X] 13D. Exhibit D, Additional Description of the Variety.

14A. Does the applicant(s) specify that seed of this variety be sold by variety name only as a class of certified seed? *(See Section 83(a). (If "Yes," answer 14B and 14C below.)* [ ] YES [X] NO

14B. Does the applicant(s) specify that this variety be limited as to number of generations? [X] YES [ ] NO

14C. If "Yes," to 14B, how many generations of production beyond breeder seed? [X] FOUNDATION [ ] REGISTERED [X] CERTIFIED

15. Does the applicant(s) agree to the publication of his/her (their) name(s) and address in the Official Journal? [X] YES [ ] NO

16. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be deposited upon request before issuance of a certificate and will be replenished periodically in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

August 31, 1977 (DATE) — Gerard W. Pepin (SIGNATURE OF APPLICANT)

(DATE) — (SIGNATURE OF APPLICANT)

' w·d 00;b
·66/7/6 p,m

INSTRUCTIONS

GENERAL: Send an original copy of the application, exhibits and $250.00 fee to U.S. Dept. of Agriculture, Agricultural Marketing Service, Grain Division, National Agricultural Library, Beltsville, Maryland 20705. (See Section 180.175 of the regulations and rules of practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

ITEM

5 Give the date the applicant determined that he had a new variety based on (1) the definition in Section 41(a) of the Act and (2) the date a decision was made to increase the seed.

13a Give (1), the genealogy, including public and commerical varieties, lines, or clones used, and the breeding method. (2), the details of subsequent stages of selection and multiplication. (3), the type and frequency of variants during reproduction and multiplication and state how these variants may be identified and (4), evidence of stability.

13b Give a summary statement of the variety's novelty. Clearly state how this novel variety may be distinguished from all other varieties in the same crop. If the new variety most closely resembles one or a group of related varieties; (1) identify these varieties and state all differences objectively; (2) Attach statistical data for characters expressed numerically and demonstrate that these differences are significant; and (3) submit, if helpful, seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty.

13c Fill in the Exhibit C, Objective Description form for all characteristics, for which you have adequate data.

13d Describe any additional characteristics that are not described, or whose description cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the description of characteristics that are difficult to describe; such as; plant habit, plant color, disease resistance, etc.

14A If "YES" is specified (seed of this variety be sold by variety name only as a class of certified seed) the applicant may NOT reverse his affirmative decision after the variety has either been sold and so labeled or published or the certificate has been issued. However, if the applicant specifies "NO", he may change his choice. (See Section 180.15 of the Regulations and Rules of Practice.)

EXHIBIT A

ORIGIN AND BREEDING HISTORY OF THE VARIETY

I. Genealogy and Breeding Method.

"Regal" is a 3 clone synthetic variety. The 3 parent clones originated from a series of crosses made in early spring of 1971. The plants used in the crosses included two selections out of the variety "Pennfine"; L4U, a parent clone from "Manhattan" perennial ryegrass; and L4K and K79, two selections of perennial ryegrass collected by Dr. C. R. Funk.

Seed from the various crosses was germinated and the seedlings were used to establish a space-plant nursery of 5,500 plants in Brookston, Indiana during the summer of 1971.

Open pollinated seed from each of about 350 selected spaced plants was harvested in 1972. Tillers from each plant were dug, and used to establish each of these plants in Albany, Oregon during the summer of 1972.

During the winter of 1972-73, seed from each plant was used in glasshouse evaluations. Turf established from each plant was evaluated for color, texture, mowing qualities and disease reaction.

Based on plant maturity and the glasshouse evaluations, 4 clones were selected for interpollination in 1973. The resulting seed was bulked and designated as PR.731.

II. Subsequent Selection and Multiplication.

Bulked seed and polycross seed from each parent clone was evaluated for turf performance, disease reaction, uniformity, and seed production. One clone was discarded as being later in maturity and more susceptible to crown rust, making Regal a 3 clone synthetic variety.

A one acre breeder field was vegetatively established in 1975. The field was further expanded to about four acres in 1976. About 150 acres of certified production fields were established in 1976 from the 1976 breeder seed crop.

III. Type, Frequency and Identification of Variants.

The 3 parent clones are quite similar in maturity and appearance. Thus Regal shows above average uniformity in second generation (certified) seed.

IV. Evidence of Stability.

Regal appears to be a very stable variety. The 3 parent clones pollinate at the same time and the certified fields are quite uniform.

Turf plots established from Syn 1 (breeder) and Syn 2 (Certified) seed appear to be identical in all respects.

At this time, no Foundation class of seed is planned. Breeder seed will be used to plant certified production fields. A Foundation class of seed may be established later if the Breeder-Certified system is not feasible.

EXHIBIT B-NOVELTY

Regal most closely resembles Citation; however, Regal has fewer spikelets than Citation, (2) has greater billbug reisistance, and (3) has fewer tillers per CM^2.

TABLE 2

* Number of Spikelets per Spike of Perennial Ryegrass Cultivars at Tangent, Oregon.

Variety	Number of Spikelets/Spike		
	1977	1981	1982**
REGAL	18	19	16
LINN		21	
YORKTOWN 2		23	
CARAVELLE		21	
FIESTA		23	
ELKA		23	
OMEGA	23	21	
MANHATTAN		28	21
BARRY		26	
CITATION	21	21	19
DERBY	20	21	19
BLAZER		24	
PENNFINE	19	23	21
LSD .05	0.6	1.1	1.2

* Population size - 100/variety in 1977 and 40/variety in 1981 and 1982.

** 1982 was a drought year and plants were generally smaller than normal.

TABLE 5

Relative billbug* damage of perennial ryegrass varieties in turf trials** at Adelphia, New Jersey.

Variety	Percent Turf Damage
Pennant	3
Regal	4
Clipper	13
Barry	16
Lp20	17
Pennfine	17
Dasher	18
Score	19
Exponent	20
Sprinter	21
Manhattan	22
NK-100	26
Venlona	26
Ranger	26
Blazer	28
Linn	29
Arno	32
Fiesta	32
Belle	34
Diplomat	36
Rex	37
Birdie	37
Ensporta	37
S-321	37
NK-200	38
Loretta	38
Citation	39
Derby	40
Player	40
Omega	40
Idole	41
Acclaim	42
S-101	44
Hunter	45
Yorktown II	49
Caravelle	49
LSD 0.05	14

*Damage caused primarily by billbugs (Sphenophorus parvulus Gyllenhal)

** Turf trial was seeded August 1977. Billbug damage estimates were made during early August 1981.

TILLER DENSITY OF SELECTED RYEGRASS VARIETIES

Tillers Per 100 cm^2

Variety	New Jersey ①	Arkansas ②	Oregon ③
Regal	416	293	262
Citation	517	411	287
Derby	446	391	249
Pennfine	447	388	290
Manhattan	437	301	249
Linn	279	228	198
LSD .05	72	66	21

① Adelphi, New Jersey, December 1978, mowing height was 3/4 inch.

② Fayetteville, Arkansas, April 1977, mowing height 1 inch

③ Tangent, Oregon, May 1977, mowing height 1.5 inches.

FORM APPROVED: OMB NO. 40-R3712

FORM GR-470-36
(9-76)

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

OBJECTIVE DESCRIPTION OF CULTIVARS
RYEGRASS
(Lolium spp.)

NAME OF APPLICANT(S)	VARIETY NAME OR TEMPORARY DESIGNATION
International Seeds, Inc.	REGAL
ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code)* 820 First St. (P.O. Box 168) Halsey, OR 97348	FOR OFFICIAL USE ONLY PVPO NUMBER 7700110

Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in first box (e.g. [0][8][9] or [0][9].)when number if either 99 or less or 9 or less. Descriptions of characters should represent those that are typical for the variety. Ranges may be given also. Measured data should be for SPACED PLANTS. Give additional description for all characteristics that cannot be adequately described in the form below. Append all petrinent comparative trial and evaluation data.

1. SPECIES:

[2] 1 = L. MULTIFLORUM (annual or Italian: includes Westerwoldicum) 2 = L. PERENNE (perennial) 3 = L. RIGIDUM (includes Wimmera)
4 = HYBRID (of species) _____ 5 = OTHER *(Specify)* _____

2. PLOIDY:

[1] 1 = DIPLOID 2 = TETRAPLOID 3 = OTHER *(Specify)* _____

3. DURATION:

[3] 1 = ANNUAL OR BIENNIAL 2 = SHORT LIVED PERENNIAL (3-4 years) 3 = PERENNIAL (more than 4 years)

STANDARD CULTIVARS

1 = GULF 2 = WIMMERA 62 3 = LINN 4 = PELO
5 = NORLEA 6 = ABERYSTWYTH S-23 7 = MANHATTAN 8 = PENNFINE

4. MATURITY (50% HEADED) Use standards from above for comparison:

[1] 1 = VERY EARLY 3 = EARLY 5 = MEDIUM 7 = LATE 9 = VERY LATE

[0][2] DAYS EARLIER THAN . . . . . [8] STANDARD CULTIVAR

[0][0] DAYS LATER THAN . . . . . [3] STANDARD CULTIVAR

5. MATURE PLANT HEIGHT (Use standard cultivars from above) :

[0][7][5] CM. HIGH

[0][0][2] CM. SHORTER THAN . . . . . [8] STANDARD CULTIVAR

[ ][ ][ ] CM. TALLER THAN . . . . . [ ] STANDARD CULTIVAR

6. PERCENT WINTER DAMAGE (estimated as percent of the area appearing dead). Use standard cultivars from above for comparison:

[ ][ ][ ] PERCENT DAMAGE OF APPLICATION CULTIVAR

[ ][ ][ ] PERCENT DAMAGE OF . . . . . [ ] STANDARD CULTIVAR

7. TURF DENSITY Use standard cultivars from above:

[2][9][3] TILLERS PER 100 SQ. CM.

[0][9][5] LESS TILLERS PER 100 SQ. CM. THAN . . . . [8] STANDARD CULTIVAR

[0][6][5] MORE TILLERS PER 100 SQ. CM. THAN . . . [3] STANDARD CULTIVAR

8. FLAG LEAF (at full growth) Use standard cultivars from above:

[0][1][7] CM. LENGTH (from ligule to tip) [ ][ ][ ] MM. WIDTH (at widest point)

[ ][ ][ ] CM. SHORTER THAN . . . . . [ ] STANDARD CULTIVAR

[0][0][1] CM. LONGER THAN . . . . . [8] STANDARD CULTIVAR

[ ][ ][ ] MM. NARROWER THAN . . . . . [ ] STANDARD CULTIVAR

[ ][ ][ ] MM. WIDER THAN . . . . . [ ] STANDARD CULTIVAR

[ ] FLAG LEAF AT BOOT STAGE: 1 = DEFLEXED 3 = RECURVED 5 = HORIZONTAL 7 = SEMI-ERECT 9 = ERECT

EXHIBIT D - ADDITIONAL INFORMATION

Regal is earlier in maturity than Citation (2 out of 5 years), has a shorter seed spike (2 out of 4 years), and has better turf performance in transition zone areas than Citation. (Data enclosed)

Regal also shows a small percentage of flourescence (less than 1 percent) in laboratory tests on the seed. It is not known whether this is genetic and therefore a "variant' or whether this is a contaminant and therefore, an "off-type".

TABLE 1

* Spike Length of Perennial Ryegrass Cultivars at Tangent, Oregon.

Variety	Spike Length (mm) 1977	1980	1981	1982**
REGAL	181	216	160	124
LINN	-	266	197	-
YORKTOWN 2	-	230	185	-
CARAVELLE	-	197	162	-
FIESTA	-	244	199	-
ELKA	-	198	162	-
OMEGA	227	244	197	-
MANHATTAN	-	288	250	172
BARRY	-	245	204	-
CITATION	208	233	173	144
DERBY	207	246	185	139
BLAZER	-	254	201	-
PENNFINE	196	251	197	148
LSD .05	16mm	18mm	15mm	16mm

* Sample size was 100 plants per variety in 1977 and 40/variety in 1980, 1981, and 1982.

** 1982 Was a drought year and spaced plants were generally smaller than normal.

EXHIBIT D

Table 1

DATE OF 50% HEADING FOR PERENNIAL RYEGRASS CULTIVARS NEAR ALBANY, OREGON: 45° N LAT.

CULTIVAR	1975	1976	1977
REGAL	May 14	May 6	May 1
LINN	May 14	-	-
PENNFINE	May 18	-	May 2
CITATION	-	May 9	May 3
DERBY	May 18	May 13	May 6
OMEGA	-	-	May 13
YORKTOWN 2	-	-	May 25
DIPLOMAT	-	-	May 25
MANHATTAN	June 5	-	June 1
PELO	June 5	-	-
S.23	June 7	-	-
LSD.05	2.6 Days	1.5 Days	2.5 days

TABLE 4

Heading Date of Perennial Ryegrass Cultivars at Tangent, Oregon.

Variety	Heading Dates 1976	1977	1980	1981	1982	Average
REGAL	May 6	May 1	May 2	May 4	May 1	May 3
LINN			April 28	May 1		
YORKTOWN 2		May 25	May 23	May 24		
CARAVELLE			May 19	May 19		
FIESTA			May 10	May 11		
ELKA			June 5	June 3		
OMEGA		May 13	May 14	May 12		
MANHATTAN		June 1	May 27	May 24	May 26	
BARRY			May 28	May 26		
CITATION	May 9	May 3 +2	May 3 +1	May 5 +1	May 5	May 5
DERBY	May 13	May 6	May 7	May 8	May 10	May 9
BLAZER			May 19	May 20		
PENNFINE		May 2	May 3	May 5	May 6	
LSD .05 Days	1.5	2.5	3	3	3	1.3

EXHIBIT D
Table 2

COMPARISON OF PERENNIAL RYEGRASS CULTIVARS 1977

ALBANY, OREGON

Cultivar	Turf Density Tillers/100 cm2	Leaf Width,mm	Plant Height, cm	Spike Length, mm	Number of Spikelets	Ave. Spikelet Length, mm
REGAL	262	2.07	75	181	18.1	14.0
PENNFINE	290	2.04	77	196	19.4	15.6
DERBY	249	2.15	80	207	20.4	13.8
CITATION	287	2.05	74	208	20.9	14.8
MANHATTAN	249	2.07	-	-	-	-
LINN	198	2.06	-	-	-	-
OMEGA	321	2.11	77	227	23.4	14.1
LSD.05	-	-	-	16	0.6	-

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EXHIBIT D
Table 3

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COLOR INTENSITY OF 14
PERENNIAL RYEGRASS CULTIVARS
Tangent, Oregon 9= Darkest Color

CULTIVAR	COLOR Dec. 28, 1976
CITATION	9.0
REGAL	8.8
DERBY	8.2
OMEGA	8.0
YORKTOWN	8.0
PENNFINE	7.6
YORKTOWN 2	7.6
DIPLOMAT	7.6
NORLEA	7.0
MANHATTAN	6.8
CARAVELLE	6.6
LORETTA	5.8
LINN	5.6
NK 100	4.2
LSD.05	0.6

PLOT SIZE 3 X 5 Ft.
5 Replications

EXHIBIT D
Table 4

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BROOKSTON, INDIANA TURF TRIAL

Seeded August 1973

9 = Darkest color, best resistance and best growth

VARIETY	COLOR 1973	COLOR 1974	Rust Resistance 1973	Rust Resistance 1974	Mowing Quality 1974	Turf Quality 1974	Turf Quality 1975
DERBY	8.6	7.8	4.3	4.4	5.2	7.4	8.2
MANHATTAN	6.8	5.9	2.1	3.4	4.9	6.0	8.0
PENNFINE	8.0	7.4	4.9	4.8	6.1	7.5	8.8
ENSPORTA	7.3	5.8	4.0	5.1	3.2	6.0	6.8
ETON	5.7	6.2	1.3	1.6	5.3	6.6	6.8
NK 100	5.7	5.2	5.4	5.6	2.8	4.9	6.3
GAME	7.2	4.9	4.9	5.8	3.5	5.8	7.3
COMPAS	5.8	4.6	5.7	5.9	4.1	4.8	6.3
SPORTIVA	6.5	6.0	6.2	6.4	4.2	4.8	6.0
LINN	6.0	4.6	5.4	6.2	1.1	4.2	6.0
ORE. COMMON	6.0	6.0	4.2	6.8	2.0	4.2	5.3
PR. 731 (REGAL)	9.0	8.5	7.8	7.6	3.8	8.1	8.5
ME. 722	7.7	6.8	4.2	4.4	6.7	7.3	8.2
NK 200	5.7	5.2	5.6	5.8	2.7	4.8	6.5

EXHIBIT D
TABLE 6

UNIVERSITY OF ARKANSAS

TURF TRIALS

SEEDED: SEPT. 20, 1976

Variety	SUMMER TURF QUALITY 8/17/77	9/15/77	7/6/78	8/3/78	TURF DENSITY April 1977	June 1977	June 1978
1. Manhattan	3.2 bc	2.5 cd	4.3 cd	3.3 b	301 bcd	244 ab	278 abc
2. Diplomat	2.9 bcd	2.8 c	4.6 a-d	3.2 b	388 a	252 ab	307 ab
3. Yorktown	2.4 cde	2.3 cde	4.8 abc	3.4 b	368 ab	253 ab	255 bcd
4. Derby	3.7 b	3.9 b	5.0 ab	4.2 a	391 a	289 a	262 a-d
5. Pennfine	2.3 cde	2.7 c	4.5 bcd	3.0 bc	388 a	231 ab	285 abc
6. Linn	3.2 bc	3.0 c	3.2 e	2.9 bc	228 d	160 cd	206 d
7. NK-200	1.8 e	1.7 de	3.2 e	1.8 d	291 cd	148 d	220 cd
8. Citation	2.1 de	2.3 cde	4.1 d	3.4 b	411 a	205 bc	265 a-d
9. Pelo	2.0 de	1.6 e	3.1 e	2.0 d	261 d	205 bc	253 bcd
10. Regal	5.7 a	4.9 a	5.2 a	4.2 a	293 cd	217 b	249 bcd
11. K5-90	2.7 cde	3.1 c	4.2 cd	3.2 b	345 abc	224 b	318 ab
12. Yorktown II	2.5 cde	2.5 cd	4.3 cd	2.3 cd	353 abc	261 ab	330 a
CV	24	21	10.7	17.2	15.5	18.0	17.8
LSD	0.87	0.74	0.57	0.67	66	51	61

TABLE 5

Spike Length of 15 Perennial Ryegrass Cultivars at Tangent, Oregon in 1980.

Variety	Spike Length (mm)
REGAL	216
CARAVELLE	197
ELKA	198
YORKTOWN 2	230
CITATION	233
JACKPOT	238
FIESTA	244
OMEGA	244
BARRY	245
DERBY	246
PENNFINE	251
YORKTOWN	252
BLAZER	254
LINN	266
MANHATTAN	288
LSD .05	18 mm

Table 11 Winter injury on perennial ryegrass cultivars in tests seeded August 30, 1977 at Adelphia, New Jersey.

Cultivar	Percent winter injury March 30, 1978
1. Blazer	0
2. Yorktown II	0
3. Belle	0
4. Fiesta	0
5. Diplomat	0
6. Dasher	0
7. Omega	0
8. Regal	0
9. Manhattan	0
10. Score	4
11. Nk200	4
12. Loretta	5
13. Hunter	8
14. Sprinter	8
15. Citation	11
16. Birdie	12
17. Derby	14
18. Pennfine	18
19. Ensporta	24
20. Venlona	28
21. NK100	31
22. Linn	38
23. Caravelle	45
24. S-101	48
25. S-321	63
LSD at 5%	7.3

Not For Publication

Characteristics of 28 perennial ryegrass varieties for turf use in New Jersey

Variety	Turf performance in N. J.	Color	Leaf texture	Density	Vertical leaf elongation rate	Tolerance of close mowing	Heat Tolerance	Cold tolerance	Resistance to winter brown blight	Resistance to Rhizoctonia brown patch	Resistance to crown rust	Resistance to sod webworms	Resistance to billbugs	Average
Palmer	7.8	7	7	8	8	8	8	6	7	8	7	5	-	7.0
Pennant	6.2	7	6	6	6	7	8	6	6	7	7	8	8	6.8
Manhattan II	7.6	7	7	8	7	8	8	6	7	7	6	4	-	6.7
Prelude	7.5	7	6	8	7	8	7	6	6	7	8	5	4	6.7
R-39A	7.6	7	7	8	7	8	7	6	7	7	8	2	-	6.6
Premier	7.3	7	7	8	7	8	7	6	6	7	7	5	4	6.6
All*Star	7.3	7	7	8	7	7	7	6	6	7	6	7	-	6.6
Blazer	7.2	7	7	8	7	8	7	6	7	7	6	2	4	6.4
Delray	5.5	6	6	6	7	7	7	8	3	7	7	2	-	6.4
HR-1	7.4	6	7	7	7	7	7	6	6	7	6	4	4	6.3
Dasher	6.5	6	6	7	7	8	8	6	6	7	7	2	5	6.3
Yorktown II	7.0	7	8	8	7	8	6	7	7	7	5	2	2	6.2
Belle	6.9	7	6	7	7	8	7	6	7	7	6	2	3	6.2
Fiesta	6.7	7	7	7	7	8	7	6	6	7	7	2	3	6.2
Barry	6.4	7	7	7	7	8	7	6	6	7	5	2	5	6.2
Elka	6.6	4	8	8	8	8	7	5	5	5	9	2	-	6.1
Diplomat	6.3	7	7	7	7	8	7	6	7	7	4	2	3	6.0
Regal	6.3	7	6	6	6	7	8	6	4	7	4	3	8	6.0
Omega	6.0	7	6	7	7	7	7	7	7	7	4	2	2	5.9
Loretta	6.1	4	8	8	7	8	6	5	6	5	8	2	2	5.8
Citation	5.9	8	7	6	7	7	8	5	3	7	5	2	2	5.6
Derby	5.9	7	6	6	6	7	7	5	4	7	4	2	2	5.6
Pennfine	5.7	6	6	6	6	7	7	5	3	7	5	2	5	5.4
Manhattan	5.5	6	6	6	6	7	6	7	7	5	3	2	4	5.4
Caravelle	5.2	9	6	6	7	7	3	3	5	4	4	2	2	4.9

Characteristics of 28 perennial ryegrass varieties for turf use in New Jersey

Variety	Turf performance in N. J.	Color	Leaf texture	Density	Vertical leaf elongation rate	Tolerance of close mowing	Heat Tolerance	Cold tolerance	Resistance to winter brown blight	Resistance to Rhizoctonia brown patch	Resistance to crown rust	Resistance to sod webworms	Resistance to billbugs	Average
Rex	4.8	6	5	5	5	6	5	5	5	4	5	2	3	4.7
Cropper	2.5	4	3	3	3	3	3	4	5	2	8	2	-	3.6
Linn	2.3	4	3	3	3	3	3	3	4	2	6	2	3	3.2

Rating scale = 0 to 9 with highest numbers denoting best performance scores, darkest color, finest texture, lowest rate of vertical growth. best tolerance of close mowing, greatest heat tolerance, best cold tolerance, and best resistance to winter brown blight, Rhizoctonia brown patch, crown rust, sod webworms, and billbugs.

United States Department of Agriculture
Agricultural Marketing Service
Livestock, Meat, Grain, and Seed Division
National Agricultural Library Building Beltsville, MD 20705

MAR 1984

TO : Linda Sonnen, Accessions Clerk
National Seed Storage Laboratory

FROM : Patti Wheeler, Secretary
Plant Variety Protection Office

Patti

SUBJECT: Seed Samples of Protected Varieties

This form identifies the attached seed sample which is being forwarded to the National Seed Storage Laboratory for germination testing and storage.

PV # 7700110

KIND Ryegrass, Perennial

VARIETY Regal

BREEDER International Seeds, Inc.

Results from germination testing: _____ % DATE: _____

This form is in duplicate. Please return one form when germination testing is completed.

Attachment: Seed Sample

In duplicate.

United States Department of Agriculture
Agricultural Marketing Service
Livestock, Meat, Grain, and Seed Division
National Agricultural Library Building
Beltsville, MD 20705

MAR 1984

TO : Linda Sonnen, Accessions Clerk
National Seed Storage Laboratory

FROM : Patti Wheeler, Secretary
Plant Variety Protection Office

Patti

SUBJECT: Seed Samples of Protected Varieties

LP-323

This form identifies the attached seed sample which is being forwarded to the National Seed Storage Laboratory for germination testing and storage.

PV # 7700110

KIND Ryegrass, Perennial

VARIETY Regal

BREEDER International Seeds, Inc.

Results from germination testing: 86 % DATE: 7/84

This form is in duplicate. Please return one form when germination testing is completed.

Attachment: Seed Sample

In duplicate.

FORM APPROVED: OMB NO. 40-R3712

FORM GR-470-36
(9-76)

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

OBJECTIVE DESCRIPTION OF CULTIVARS
RYEGRASS
(Lolium spp.)

NAME OF APPLICANT(S)	VARIETY NAME OR TEMPORARY DESIGNATION
International Seeds, Inc.	REGAL
ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code)* 820 First St. (P.O. Box 168) Halsey, OR 97348	**FOR OFFICIAL USE ONLY** PVPO NUMBER 7700110

Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in first box (e.g. [0][8][9] or [0][9].)when number if either 99 or less or 9 or less. Descriptions of characters should represent those that are typical for the variety. Ranges may be given also. Measured data should be for SPACED PLANTS. Give additional description for all characteristics that cannot be adequately described in the form below. Append all pertinent comparative trial and evaluation data.

1. SPECIES:

[2] 1 = L. MULTIFLORUM (annual or Italian: includes Westerwoldicum) 2 = L. PERENNE (perennial) 3 = L. RIGIDUM (includes Wimmera)
4 = HYBRID (of species) _____ 5 = OTHER *(Specify)* _____

2. PLOIDY:

[1] 1 = DIPLOID 2 = TETRAPLOID 3 = OTHER *(Specify)* _____

3. DURATION:

[3] 1 = ANNUAL OR BIENNIAL 2 = SHORT LIVED PERENNIAL (3-4 years) 3 = PERENNIAL (more than 4 years)

STANDARD CULTIVARS

1 = GULF 2 = WIMMERA 62 3 = LINN 4 = PELO
5 = NORLEA 6 = ABERYSTWYTH S-23 7 = MANHATTAN 8 = PENNFINE

4. MATURITY (50% HEADED) Use standards from above for comparison:

[1] 1 = VERY EARLY 3 = EARLY 5 = MEDIUM 7 = LATE 9 = VERY LATE

[0][2] DAYS EARLIER THAN . . . . . [8] STANDARD CULTIVAR
[0][0] DAYS LATER THAN . . . . . [3] STANDARD CULTIVAR

5. MATURE PLANT HEIGHT (Use standard cultivars from above) :

[0][7][5] CM. HIGH
[0][0][2] CM. SHORTER THAN . . . . . [8] STANDARD CULTIVAR
[ ][ ][ ] CM. TALLER THAN . . . . . [ ] STANDARD CULTIVAR

6. PERCENT WINTER DAMAGE (estimated as percent of the area appearing dead). Use standard cultivars from above for comparison:

[ ][ ][ ] PERCENT DAMAGE OF APPLICATION CULTIVAR
[ ][ ][ ] PERCENT DAMAGE OF . . . . . [ ] STANDARD CULTIVAR

7. TURF DENSITY Use standard cultivars from above:

[2][9][3] TILLERS PER 100 SQ. CM.
[0][9][5] LESS TILLERS PER 100 SQ. CM. THAN . . . . [8] STANDARD CULTIVAR
[0][6][5] MORE TILLERS PER 100 SQ. CM. THAN . . . [3] STANDARD CULTIVAR

8. FLAG LEAF (at full growth) Use standard cultivars from above:

[0][1][7] CM. LENGTH (from ligule to tip) [ ][ ][ ] MM. WIDTH (at widest point)
[ ][ ][ ] CM. SHORTER THAN . . . . . [ ] STANDARD CULTIVAR
[0][0][1] CM. LONGER THAN . . . . . [8] STANDARD CULTIVAR
[ ][ ][ ] MM. NARROWER THAN . . . . . [ ] STANDARD CULTIVAR
[ ][ ][ ] MM. WIDER THAN . . . . . [ ] STANDARD CULTIVAR

[ ] FLAG LEAF AT BOOT STAGE: 1 = DEFLEXED 3 = RECURVED 5 = HORIZONTAL 7 = SEMI-ERECT 9 = ERECT

STANDARD CULTIVARS

1 = GULF 2 = WIMMERA 62 3 = LINN 4 = PELO
5 = NORLEA 6 = ABERYSTWYTH S-23 7 = MANHATTAN 8 = PENNFINE

9. LEAVES:

[3] VERNATION: 1 = LEAVES ROLLED IN YOUNG SHOOTS
2 = LEAVES SEMI-ROLLED (folded with rolled edges)
3 = LEAVES FOLDED IN YOUNG SHOOTS

[ ] % PLANTS WITH ANTHOCYANIN IN LOWER LEAF SHEATH

[3] FOLIAGE COLOR: 1 = YELLOW GREEN 2 = MEDIUM GREEN 3 = BLUE GREEN

10. SPIKE:

[181] MM. SPIKE LENGTH (tip to internode below lowest floret)

[13] MM. SHORTER THAN [8] } USE STANDARD CULTIVARS FROM ABOVE

[ ] MM. LONGER THAN [ ] }

[3400] MG. PER TEN SPIKES (trimmed to internode below lowest floret)

[1200] MG. LIGHTER PER TEN SPIKES THAN [8] } USE STANDARD CULTIVARS FROM ABOVE

[ ] MG. HEAVIER PER TEN SPIKES THAN [ ] }

[ ] FLORETS PER SPIKELET

PERCENTAGE OF PLANTS WITH:

RACHIS: [ ] % SMOOTH [ ] % ROUGH

SPIKE COLOR: [ ] % GREEN [ ] % PURPLE

LEMMA: [000] % AWNED [000] MM. AWN LENGTH

[ ] MM. GLUME LENGTH

[2] 1 = SPIKELET LENGTH NEARLY EQUAL TO OUTER GLUMES
2 = SPIKELET LENGTH MUCH LONGER THAN OUTER GLUMES

11. COLEOPTILE:

[ ] % PLANTS WITH ANTHOCYANIN IN COLEOPTILE

12. ANTHER COLOR:

[ ] % PLANTS WITH WHITE ANTHERS [ ] % PLANTS WITH YELLOW ANTHERS

[ ] % PLANTS WITH PURPLE ANTHERS

13. ROOT AND PLANT CHARACTERS:

[ ] % PLANTS WITH PROSTRATE GROWTH HABIT [***] % PLANTS WITH FLUROESCENT ROOTS

Between 0 and 1%

[ ] % PLANTS WITH UPRIGHT GROWTH HABIT

14. SEED:

1. [500] MG. PER 1,000 SEED [055] MM. TOTAL LENGTH OF 10 SEEDS [012] MM. TOTAL WIDTH OF TEN SEEDS

15. DISEASE (0 = NOT TESTED, 2 = HIGHLY SUSCEPTIBLE, 4 = MODERATELY SUSCEPTIBLE, 6 = MODERATELY RESISTANT, 8 = HIGHLY RESISTANT):

6	CROWN RUST (Puccinia coronata)	8	DOLLAR SPOT (Sclerotinia)	8	BROWN PATCH (Rhizoctonia)
4	LEAF SPOT (Helminthosporium)	8	MILDEW		OTHER *(Specify)*
0	SNOW MOLD (Typhula)	6	RED THREAD (Corticium)		

16. INSECT (0 = NOT TESTED, 2 = HIGHLY SUSCEPTIBLE, 4 = MODERATELY SUSCEPTIBLE, 6 = MODERATELY RESISTANT, 8 = HIGHLY RESISTANT):

0 *(Specify)* _____

17. GIVE RESEMBLANCE VALUE IN LEFT COLUMN AND VARIETY CODE NUMBER IN RIGHT COLUMN FOR VARIETY WITH WHICH COMPARISON IS MADE (1 = LESS THAN, 2 = SAME AS, 3 = MORE ERECT, MORE RESISTANT, DENSER, MORE PERSISTENT, DARKER OR GREATER HEIGHT.):

RESEMBLANCE	CHARACTER	SIMILAR VARIETY	
2	PLANT HABIT (erectness)	8	1 = GULF
2	TILLERING	8	2 = WIMMERA 62
2	WINTER HARDINESS	8	3 = LINN
3	HIGH TEMP. STRESS RESISTANCE	8	4 = PELO
2	TURF PERSISTENCE	8	5 = NORLEA
3	PLANT COLOR	8	6 = ABERYSTWYTH S-23
1	VERTICAL SEEDLING GROWTH RATE	8	7 = MANHATTAN
1	CROWN DENSITY	8	8 = PENNFINE
2	MOWER SHREDDING RESISTANCE	8	

18. GIVE AREA OF ADAPTATION AND INTENDED USE: Throughout the cool season turfgrass area.

19. GIVE AREA TEST RESULTS PRESENTED FROM: Albany, Oregon.

COMMENTS: